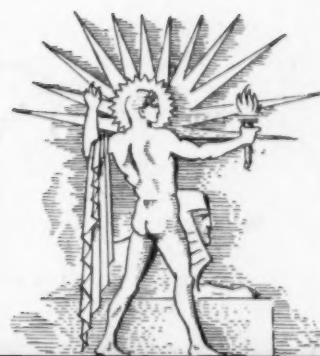


# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



March 15, 1941

Fossil Flakes

See Page 172

A SCIENCE SERVICE PUBLICATION

## Do You Know?

England's *potato* crop is the biggest in many years.

Rapid cooling hardens ordinary steel, but it softens chromium-nickel *stainless steel*.

*Peanut oil* is being increasingly used in shortenings and oleomargarine, due to its resistance to rancidity.

Washington State's *apple orchards* trace history to apple seeds brought by a member of the Hudson Bay Company.

Government agriculturists report that *smoke* is a popular food flavor and now includes smoked cheese, turkey, game, salt and oysters.

In the isolation of the ancient world, it took the invention of *wheeled vehicles* about 2,000 miles to reach Egypt from western Asia.

British engineers report that *rubber fenders* for automobiles and trucks resist denting, are waterproof and rustless and save metal.

Besides his famous singing, the *mocking bird* broadcasts noises that have been likened to radio squeals, creaking doors, and the postman's whistle.

Kansas rates its *coal reserves* larger now than they were 20 years ago, because advances in strip-mining technique permit mining of coal beds so thin that they were formerly not considered commercially valuable.

## QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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What new type of plane carries a smaller one inside? p. 169.

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### PSYCHOLOGY-GENETICS

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What American troops will be vaccinated against yellow fever? p. 168.

When will the measles epidemic reach its peak? p. 165.

### SURGERY

Why is it necessary for a surgeon to remove carefully the talcum powder from his gloves? p. 168.

In 20 years, scientists studying *bird habits* have banded more than 3,000,000 birds, and have obtained reports later on 200,000 of them.

An original record of *Thomas Edison's voice* has been presented to the Franklin Institute in Philadelphia by the Edison Birthday Committee.

To help solve the problem of *shelter* for migrant farm families the Farm Security Administration has established 53 camps, providing for 10,000 families.

*Plastic* is being carefully tested by airplane builders as a substitute for metal in flooring, cowl covers and engine baffles.

A Science-in-Sports Department and a Sports Gallery are new *museum* ventures at the Franklin Institute in Philadelphia.

Cambridge University has a collection of *potato* specimens collected in South America prior to the war, with a view to improving potato varieties.

## SCIENCE NEWS LETTER

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## PHYSICS

# New Radium-Like Carbon May Have Medical Uses

Unusually Long Half Life of Thousand Years Makes C-14 Valuable as Tracer Element for Research Use

**M**ODERN alchemy, which turns one element into another, has now made from nitrogen a form of carbon which promises to have important uses in medicine and other sciences, announce two researchers at the University of California.

This kind, or isotope, of carbon is of mass 14, somewhat heavier than normal carbon, principally composed of the isotope of mass twelve. Unlike ordinary carbon, the new kind, C-14, gives off beta rays, one kind of radiation emitted by radium. It consists of atomic fragments called electrons. C-14 does not, however, give off gamma rays, which resemble X-rays, and are responsible for the medical effects of radium.

Dr. Samuel Ruben and M. D. Kamen, of the University of California, reveal their success in preparing appreciable quantities of C-14 with the cyclotron, or "atom-smasher," of the University. (*Physical Review*, Feb. 15)

For six months two five-gallon carboys of a concentrated solution of ammonium nitrate, in which no carbon is present, were exposed to a constant rain of neutrons from the atom-smasher. Some nitrogen atoms, which have the same mass as C-14, were converted into the carbon isotope. These were extracted in the form of various carbon compounds. Their radioactivity was tested by means of a Geiger counter, which detects the beta rays. The samples showed consider-

able activity, far more than any of the materials used originally, before the bombardment with neutrons.

It is expected that C-14 will prove important as a tracer element, in medical and botanical research, and it may be prepared commercially in large quantities for such use. Carbon is the most widespread element in living organisms. Ordinarily it is not possible to distinguish one carbon atom from another, but radioactivity forms a tag for identification. If C-14 atoms are introduced at one part of a living organism, they can be located elsewhere by their effect on a Geiger counter.

Another advantage of C-14 is that it has a long life. Continually giving off energy, radioactive elements are gradually used up. C-14 disintegrates so slowly that after 1000 years there will still be at least half of the original quantity remaining.

Dr. Ruben and Mr. Kamen point out that in some ways the long life of C-14 is unfortunate, since it requires a long time to prepare it. They point out, however, that there are methods for concentrating it from the other isotopes. In addition, they suggest, end products of a reaction in which it is used can be collected, the C-14 reconcentrated, and used over again.

*Science News Letter, March 15, 1941*

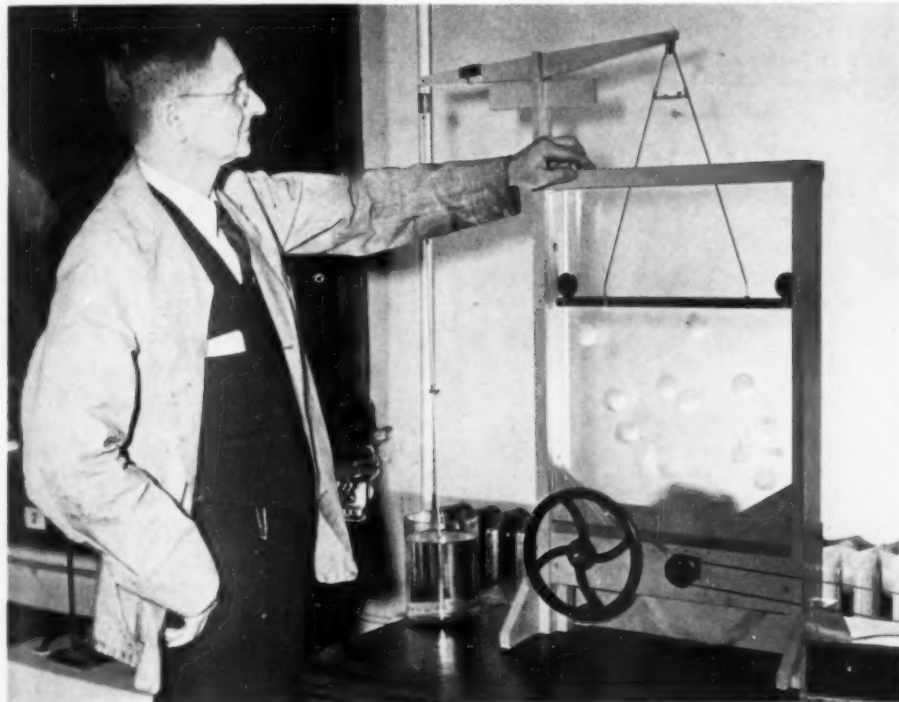
## BACTERIOLOGY

## Nitrogen-Capturing Germs Best on Oxygen Shortage

**W**ET, soggy soils are more likely to build up a nitrogen supply through the activity of bacteria living in them than are well-drained, well-tilled soils with free access of air. This is the conclusion of Dr. H. L. Jensen and Dr. R. J. Swaby of the University of Sydney, Australia, based on experiments reported in *Nature*. (Feb. 1)

Nitrogen-fixing bacteria that live free in the soil cannot work alone, Drs. Jensen and Swaby explain. They must obtain energy for their work from the breakdown products of carbohydrates, and for these they are dependent on the work of other bacteria, carbohydrate-digesters, with which they are associated in nature. If there is plenty of oxygen, the two Australian scientists discovered in the course of their experiments, these "assistant bacteria" do their job too well, not leaving enough for the nitrogen-fixers to eat. Oxygen shortage thus becomes an actual advantage.

*Science News Letter, March 15, 1941*



PING PONG BALLS GO TO SCHOOL

Dr. Thomas B. Brown of George Washington University devised this apparatus in which ping pong balls moving at high speed in all directions within the glass enclosure represent molecules in a heated solution. The balance over the apparatus measures the pressure on the top of the glass enclosure. By replacing the top piece the apparatus can be made to represent other physical aspects of solutions such as Brownian movement and osmosis.



## PHYSICS

# California Physicists Split U-235 Into Equal Parts

**High-Speed Neutrons of 16 Million Electron Volts Used for Fission; Got Energies of 100 Million Volts**

**B**Y SHOOTING high energy atomic bullets, or neutrons, at them, University of California physicists have succeeded in breaking the nuclei of both uranium and thorium atoms into equal parts. Importance of this is that the form of uranium used is of mass 235, the kind that, it is hoped, will make possible practicable atomic power with such a splitting or fission process.

In previous experiments, by using slow-speed neutrons, uranium was divided very unevenly, into a light element and a heavy one.

However, Dr. Emilio Segre, of the

University's Radiation Laboratory, and Dr. Glenn Seaborg, instructor in chemistry, used high-speed neutrons, with energies of 16 million electron volts, or more than three times that used earlier. These neutrons are produced by bombarding atoms in the cyclotron, or "atom-smasher."

In the splitting process, energies of 100 million or more volts are produced. Difficulty of separating uranium of mass 235 from the ordinary kind, which contains it in rather small amounts, has so far prevented actual tests of uranium power.

*Science News Letter, March 15, 1941*

## PHYSICS

# Radioactive Substances Made With California Atom-Smasher

**Germanium, Element Similar to Lead, Used in New Experiments; One of Last of Elements Studied**

**F**OUR new artificial radioactive substances have been added to those known to man, bringing the known total to about 360, it is announced by three University of California scientists.

An artificial radioactive substance is one which is made to emit rays somewhat as radium does. They are made by smashing atoms in the Berkeley cyclotron. When the atom of an element is smashed it often changes into another element and emits rays which can be detected by the use of sensitive instruments.

Four radioactive specimens of germanium, an element similar to lead, were reported by the California scientists. Germanium is one of the last of the 92 elements to be investigated in detail for radioactive species.

More than 100 of the known artificial radioactive substances have been discovered at the University of California with Prof. Ernest O. Lawrence's cyclotron.

Some of the radioactive elements have

proved invaluable in medical and biological research. Radio phosphorus is being used in experiments on the treatment of leukemia, the dread disease of the blood cells. The growth of teeth and bones is being studied by the use of radioactive strontium, radioactive iodine is revealing valuable facts about the thyroid gland, and several other elements treated by the cyclotron are literally throwing new light on biological processes.

Plant growth and nutrition are being studied also by feeding a solution of radioactive elements and following their course through roots, stems and leaves. The use and value of various basic food elements are being studied in animal and poultry nutrition with "tagged" substances.

The four radioactive germanium species were reported by Dr. Glenn T. Seaborg, instructor in chemistry, Dr. J. J. Livingood, former research associate

in the Radiation Laboratory, and Gerhart Friedlander, graduate student in chemistry.

*Science News Letter, March 15, 1941*

## CHEMISTRY

# Colors of Thin Films Used to Detect Viruses

**D**IAGNOSING disease may in future be aided by a new method which makes use of the changes of iridescent colors reflected from very thin films of transparent material.

Details of the new method which is expected to detect viruses, toxins, poisons and other tiny and invisible substances were explained in an announcement that a patent covering the method had been issued to Dr. Irving Langmuir, of the General Electric Research Laboratory.

Thin films of transparent material such as barium stearate, an insoluble soap, reflect iridescent colors, it is known. The color depends on the thickness of the film. A film with a thickness of 47/10,000,000 of an inch reflects a purple color when illuminated by a white light. If the film is made slightly thicker the color changes toward blue. The changes in thickness can thus be measured by observing the changes in color.

To detect viruses or other tiny, invisible substances, slides are first conditioned by applying the thin barium stearate film and then dipping in a 1% solution of thorium nitrate. Then it is possible to apply to the slide a substance that has a specific reaction toward the particular toxin or virus or poison or other substance for which the test is to be made.

If the suspected substance is present in the solution tested, adsorption of a single layer of uniformly thick atoms or molecules of the substance will take place on the slide surface, producing an increase in film thickness and a corresponding change in color.

Each type of substance in solution is expected to produce a characteristic increase in film thickness and corresponding change in color of the conditioned slide. Once these characteristic thicknesses and colors for known substances have been determined, identification of suspected substances will be a matter of check and comparison. Dr. Katharine B. Blodgett and Vincent J. Schaefer of the Research Laboratory staff have assisted Dr. Langmuir in the investigations, which started in 1935.

*Science News Letter, March 15, 1941*



## VIRUS DETECTION

*Dr. Irving Langmuir, of the General Electric Research Laboratory, demonstrates his new method of revealing the presence of invisible viruses through changes in the colors of very thin films.*

a good start has already been made. It is hoped the vaccinations, in spite of the eight weeks set-back due to the flu, will be completed in time to protect the children during the present epidemic. Children in homes and similar institutions usually get their measles six to nine months after children in the rest of the population, because the children in the homes are relatively isolated.

The vaccine will be given to one-half the children in the selected institutions, the other one-half remaining unvaccinated. This will give scientists a control group against which to check the protective value of the vaccine. Only children who have never had measles have been selected for both control and vaccinated groups. Permission of parents or guardians is being obtained before the vaccination is done, and just about one-half of the parents or guardians have given this permission, so there has been no need to draw lots or follow any other method for division of the children into vaccinated and not-to-be vaccinated groups.

Among the questions the scientists hope to have answered by the vaccine trials are how long and how completely the vaccine protects against measles. Until such questions are answered, the vaccine will not be released for general distribution.

*Science News Letter, March 15, 1941*

## PUBLIC HEALTH

## Measles Cases Increasing Throughout Nation

**L**OTS of measles cases between now and the middle of April are expected by the U. S. Public Health Service. The number reported by the states for the week ending March 1 totalled 31,489. The total for the entire nation for the preceding week was 24,079.

These figures show that in one week there are more than one-tenth the number of cases that occurred during the entire year of 1940. That was a low year for measles, with only 276,000 cases reported during the entire year. Last big measles year was in 1938, when the year's total reached 822,800 cases.

The trend for measles is always either low or high, but U. S. Public Health Service records for the past 20 years do not show any regular measles cycles. The ups and downs in measles depend on the fact that nearly everyone is susceptible until he has had an attack. Once all the children who are old enough to

## MEDICINE

## Anti-Measles Vaccine Will Get Trials in This Epidemic

**Many Children Are Already Being Vaccinated; Army Considering Use Among Selective Service Trainees**

**M**ANY children in New Jersey and Philadelphia are now being vaccinated with a new and promising anti-measles vaccine, and Army medical authorities are about to consider the advisability of its use among selective service men now in training camps, where measles cases are on the increase.

The vaccine is not yet ready for general distribution and use. Dr. Geoffrey Rake, of the Squibb Institute for Medical Research at New Brunswick, N. J., with Dr. Morris F. Shaffer, developed the vaccine from measles virus grown on fertile hen's eggs.

The first vaccinations on a small group of children in Philadelphia, reported as successful last fall, were conducted under the direction of Dr. Joseph Stokes, Jr., of the University of Pennsylvania Medi-

cal School. Dr. Stokes is directing the present trials of the vaccine on a wider scale and is also director of the U. S. Army's measles commission which is just being formed and at its first meeting is expected to consider the use of the vaccine in Army training camps, according to information from Lieut.-Col. J. S. Simmons, chief, preventive medicine division, office of the Surgeon General.

The vaccination of children in New Jersey and Philadelphia orphan homes, schools and similar institutions had been planned before the present outbreak of measles started. It was delayed for six or eight weeks, however, by the influenza epidemic which struck all the institutions selected for the measles vaccine trials.

The program is now going ahead and

run around and play with other children and go to school have had an attack, they are immune to it. Then there follow one or two years in which so few children are susceptible to the disease that not many cases are reported. But as more children are born and grow into the run-about and school ages, a new large group susceptible to measles develops and the number of cases suddenly increases greatly over the previous year or two.

The present epidemic is centered in New York, New Jersey, Ohio, Illinois and Michigan. Experience in previous epidemics leads public health officials

to expect the peak of the epidemic by the middle of April.

Measles is a dangerous disease and the younger the child the greater the danger. Children under three years are especially likely to have fatal complications, such as pneumonia. Parents are therefore warned to keep young children from contact with those who have measles or may be coming down with it. The first symptoms may be easily confused with those of a cold.

Injections of the blood serum of someone who has recently recovered from measles are likely to avert an attack or make it less severe.

*Science News Letter, March 15, 1941*

#### MEDICINE

## New Disease Mystery Caused By Toxoplasma

### In Adults, Ailment Might Be Mistaken for Rocky Mountain Spotted Fever; Possibly Spread by a Tick

**D**OCTORS have a new disease mystery to solve. It concerns the ailment or ailments caused by a large, one-celled parasite known as *Toxoplasma*. The deaths of two adults and one six-year-old boy from infection with *Toxoplasma*, and a non-fatal case in another little boy, are reported (*Journal, American Medical Association*, March 1). The ailment may or may not be rare. How often it occurs is one of the unknowns in the problem.

The two little boys had "atypical encephalitis," Dr. Albert B. Sabin, of the Children's Hospital Research Foundation and the University of Cincinnati College of Medicine, reports. Encephalitis means "sleeping sickness" to most laymen, but the little patients did not have typical sleeping sickness. Convulsions, fever, disorientation, and an increased number of a certain kind of white blood cells in the spinal fluid were the chief features of the disease.

In the adults, the ailment might have been mistaken for Rocky Mountain spotted fever or endemic typhus fever, according to the report of these cases by Dr. Henry Pinkerton and Dr. Richard G. Henderson, of St. Louis University School of Medicine. Rash, fever and lung involvement were the outstanding features in these cases.

*Toxoplasma*, the "germ" that caused these quite different ailments, was first

discovered in 1908 in the *gondi*, a North African rodent. Since then it has been found in many animals, such as guinea pigs, rabbits, rats and mice and has been reported as causing disease in man. Scientists generally, however, rather doubted that *Toxoplasma* could or did cause sickness in man because the evidence in the earlier reports, with one exception, was inconclusive.

Now, however, the proof is more definite. Dr. Sabin and Dr. Pinkerton and Dr. Henderson report laboratory tests, including transmission of the disease to guinea pigs by inoculation with blood or spinal fluid from the patients, which are pretty convincing evidence that the *Toxoplasma* caused the illnesses.

How the patients got the infection is part of the mystery that remains to be solved. In the cases of the two adults, there was a suggestion that ticks, such as transmit Rocky Mountain spotted fever, might have given it. A cat in the home of one of the little boys became sick and had convulsions about the time the child got sick. This was suggestive, but the cat had been disposed of, so no tests could be made to determine whether it also was infected with *Toxoplasma*. Mosquitoes had been troublesome around this home, but no ticks had been seen.

Some cases of *Toxoplasma* infection have been reported in infants and it was

thought these babies got the sickness from their mothers, although the mothers themselves did not have it.

Because the two adults who died of toxoplasmosis had lung involvements, the St. Louis doctors point out that the ailment might be transmitted directly from person to person, as the common cold is.

The infection is probably relatively rare, Dr. Sabin says, although there is "yet no indication how frequent such infection is." The St. Louis doctors, however, pointing out the similarity in the adults to recently reported cases of atypical pneumonia of unknown cause, state that it is not justifiable to assume that toxoplasmosis is a rare disease.

Treatment so far has been directed to relief of symptoms, but Dr. Sabin's report indicates that the newer sulfa drugs may prove effective. He gave sulfanilamide to one of the little boys, but without success. Later tests with mice showed that sulfapyridine and sulfathiazole have a curative effect on the infection in mice, but that sulfanilamide "only delays death but cannot prevent it" in this condition.

*Science News Letter, March 15, 1941*

#### PSYCHOLOGY—GENETICS

## Sensitivity to Noise Is Perhaps Inherited

**C**ERTAIN individuals may be advised to stay away from noisy occupations such as riveting, pneumatic drilling, the tank corps in the Army if recent psychological research is found to have human applications.

Abnormal sensitivity to noise in rats, which makes some animals go wild with activity and even have an epileptic-like fit at the sound of jingling keys, is hereditary, Dr. Norman R. F. Maier and Nathan M. Glaser, of the University of Michigan, have found.

Of 18 rats tested, all of whom were offspring of normal parents, not a single one was found to have the "neurotic" sensitivity to noise, these scientists report in the *Journal of Comparative Psychology*. (October)

But among 25 offspring of one "neurotic" and one normal parent, more than half were thrown into fits by the key jingling.

When both parents were noise sensitive, the proportion of the offspring who showed the "neurotic" tendency was increased to nearly 75 per cent.

The evidence of the experiments is that the noise sensitivity is inherited as a dominant trait, the psychologists con-



clude. This means that the trait is likely to show up in the young even when one of the parents is entirely normal.

Whether humans inherit in a similar way a tendency to get the "jitters," or other nervous ills from exposure to such violent noises as bursting bombs, gunfire, shrieking sirens or industrial noises,

cannot be deduced from these experiments. The nervous system of humans differs from that of rats, and noise probably does not have a comparable effect on even susceptible individuals. It is known, however, that excessive noise does make some people jumpy.

*Science News Letter, March 15, 1941*

#### PSYCHOLOGY

## Familiar Sights and Acts Regarded as Mental Armor

### In Times of Danger of Death, Comfort Is Found in Simple Act of Buckling on a Belt or Equipment

**A**RMOR plate against attacks of "war nerves," has been invented by a British psychologist. The new protection consists of the presence of familiar things:

Sight of a policeman's blue uniform, known and trusted since childhood.

Going through with some simple act made familiar by constant drill.

Definite orders to report at a certain place and do a certain set thing.

These are the civilian's protection for his sanity in time of great fear.

Lessons for building up home defense units in America are seen in a discussion of how to prevent tragic mental effects of the war of nerves, contained in a new book of British origin just published in the United States on *The Neuroses in War*. Dr. W. R. Bion, who has been psychiatrist in the Emergency Medical Service and captain in the Royal Tanks Corps, contributes the report on civilian morale and mental protection. (*Reviewed, SNL, this issue.*)

So far as possible, familiar organizations—the local police and fire departments—should be expanded and entrusted with duties of home defense in place of building up new and strange organizations such as England's A.R.P., Dr. Bion advises.

In time of danger of death—the great unknown—a real need is filled and comfort and strength obtained by the presence of authorities familiar since childhood.

Organization should be thorough and complete so that every man, woman and child has a task that must be done and is a part of some unit. For the aged and infirm this may be some very simple act which has its greatest value in

relieving fear. Dr. Bion recalls "the satisfying feeling that was produced on one occasion during the last war, when the objective situation appeared desperate and the enemy commenced an attack, by the simple act of having to buckle on belt and equipment before standing to arms."

The alarm, Dr. Bion emphasizes, must not be just a signal to take shelter, but a call to action. And there must be an action, however trivial, to which everyone is called.

Methods for protecting the morale of soldiers have been worked out through practical experience over many years. Similar devices must be found for civilians who now must bear the brunt of immediate contact with war fears.

The soldier is a member of a close unit. He knows that his name is on a certain roll, and his whereabouts kept track of. If anything happens to him, he is sure that his absence is not going to go undetected for long.

The soldier is in uniform. From the days of schoolboy thrillers, we become used, Dr. Bion says, to the idea of blood, or of wounds on a uniformed body. But the sight of blood on civilian clothes is unnerving.

The soldier lives by rules and manuals of drill.

The civilian should not only have his place in some defense unit, but he should be a part of some organization at home as well as at work. It is particularly terrifying to feel that you must face danger alone at night when the imagination naturally tends to run riot, magnifying dangers.

Going to school has its value in protecting the mind by returning the individual to the safe scenes of his childhood. For this reason, courses of adult education have a special value in time of national emergency.

*Science News Letter, March 15, 1941*



#### BOW-AND-ARROW BRANDING

Arrows tipped with sponge-rubber balls dipped in vari-colored paints are being used in the Gunnison National Forest for marking deer, to learn to what extent they move from one feeding area to another. The deer are not injured—not even seriously alarmed. And so tame are the herds that a marksman can stand on the same spot and "shoot" several animals before the rest of them scatter.

## SURGERY

**Powder on Gloves Responsible for Illness**

**S**ERIOUS complications and illness may follow operations if talcum powder from the surgeon's gloves gets into the surgical wound. A warning of this danger is given by Dr. Edward J. McCormick and Dr. Thomas L. Ramsey, of Toledo, Ohio. (*Journal, American Medical Association, March 1.*)

They report two cases of postoperative complications in which second operations were required, one of them resulting in the loss of the child-bearing organs in a 21-year-old woman.

In both cases crystals of magnesium silicate, or talc, were found in the inflamed tissues removed at the second operations. It is probable, the Toledo surgeons believe, that many other cases of postoperative complications caused by talcum or by lycopodium powder have gone undiagnosed in the past.

Careful washing of the gloved hands of the surgeon and his assistants, to remove the powder used on the gloves, and care to keep the air of the operating room free of the powder are urged to prevent such complications.

*Science News Letter, March 15, 1941*

## PUBLIC HEALTH

**Vaccinating U. S. Troops Against Yellow Fever**

**A**ERICAN soldiers stationed in Panama, Puerto Rico and Caribbean bases are now being vaccinated against yellow fever, the dread Yellow Jack that menaced an earlier generation of American soldiers stationed in the same part of the world during the Spanish-American War.

The vaccinations were started about February 15, following an order from the War Department approving the vaccination against yellow fever of all troops now stationed in tropical regions of the Western Hemisphere and all other troops prior to their departure for such regions.

In preparation for this vaccination order, large quantities of the yellow fever vaccine have been made by the U. S. Public Health Service and other medical laboratories in cooperation with the Rockefeller Foundation's International Health Division laboratories, where the vaccine was first developed.

Although Hawaii, according to longitude, is technically in the Western

Hemisphere, the Army yellow fever vaccination order does not apply to troops stationed there, nor, of course, in the Philippines. Yellow fever has never been a menace in those places.

If the Yellow Jack should menace unvaccinated American troops stationed outside the Western Hemisphere, however, they could be swiftly protected by the vaccine, because the yellow fever vaccine fortunately works pretty quickly in conferring immunity against the disease. It is said to be one of the few vaccines that can be used successfully in the face of an epidemic.

*Science News Letter, March 15, 1941*

## PHYSIOLOGY

**Bats Hear Sounds Much Higher Than Humans Can**

**B**ATS' ears can catch sound waves in the air up to frequencies of 98,000 cycles a second, it is indicated in experiments performed by Robert Galambos in the biological laboratories of Harvard University. (*Science, Feb. 28.*)

This is a shrillness of sound far above the upper limit of perception of the human ear. The highest insect chirps we can hear, and the vanishingly shrill pipe of the peanut vendor's whistle, represent only about 20,000 sound vibrations a second.

Mr. Galambos made his tests by hooking up extremely delicate electrical contacts to the hearing apparatus of 30 bats, and trying various sound and supersonic frequencies until he had reached a point at which no further response was registered on his instruments. Although there is no positive proof that such electrical responses by the ear indicate hearing, experiments on other animals have shown a close correspondence between the limits of such responses and the limits of ability to hear actual sounds.

The experiments now reported by Mr. Galambos are part of a program of investigation of the theory that bats avoid flying into obstacles in the dark by uttering shrill squeaks and catching their reflected echoes. Earlier researches had shown that some of the sounds uttered by bats have frequencies as high as 50,000 cycles a second.

It is possible that bats may be able to hear sounds even shriller than 98,000-cycles-a-second supersonics, for Mr. Galambos remarks, "the 98 kilocycle upper limit represented the limit of the recording apparatus, not of the cochlea."

*Science News Letter, March 15, 1941*

**IN SCIENCE**

## OCEANOGRAPHY

**Iceberg Reports by Mail Urged as Radio Cuts Down**

**I**CEBERG season is just beginning in the North Atlantic, and the Hydrographic Office of the U. S. Navy, in charge of the International Ice Patrol, has issued a request that vessels sighting icebergs report their location by mail immediately upon making port. In normal times such reports are sent at once by radio to the Canadian station at Cape Race, Newfoundland; but the statement adds, "It is realized that this year, due to the European hostilities, many vessels are maintaining radio silence." In making the request the Hydrographic Office stipulates that the names and nationalities of reporting vessels are not required.

*Science News Letter, March 15, 1941*

## ASTRONOMY

**Startling Color Changes in Star Seen from Ship**

**T**HE STAR Sirius, changing in color from red to light green, was the startling sight observed recently from a ship in the tropical Pacific Ocean, west of the Galapagos Islands.

In a report to the Hydrographic Office of the U. S. Navy, the observer, whose name and ship are not revealed, says that he was taking a sight on the star, when he noticed the color changes. Then he looked through binoculars, "and it was found that nearly all the colors of the spectrum were included in its changes." Sirius was then just rising in the east. As it climbed higher the colors faded.

Such an effect is an exaggerated form of the familiar twinkling. As the star's light passes through regions of the air of different temperatures it is bent one way, then another. When the temperature differences are unusually great, the air acts as a prism, and spreads the beam out into an actual spectrum. Because of the movement of the air and also, in this case, of the ship, the observer sees changing parts of this spectrum, and hence the changes of color.

*Science News Letter, March 15, 1941*



# NE FIELDS

## HORTICULTURE

### New Disease of Carnations Discovered at Spokane

**C**ARNATIONS are being killed by a new disease, caused by an apparently unknown bacterium. The malady made its first appearance in a greenhouse at Spokane, it is reported by Leon K. Jones, of the State College of Washington. (*Phytopathology*.)

Characteristic of the new malady is the production of grayish-green foliage, followed by yellowing and death of the plants, similar to the symptoms commonly associated with the wilt disease. Yellow streaks of frayed tissue in the woody areas, extending 12 to 24 inches up the stems of affected plants, are distinguishing symptoms. The disease is most damaging during warm weather of fall and spring.

W. H. Burkholder, plant pathologist of Cornell University, at Ithaca, New York, is studying the bacterium to determine its exact identity.

*Science News Letter, March 15, 1941*

## ANTHROPOLOGY

### Most Human Beings Are A Little "Wopper-Jawed"

**M**OST human beings are a trifle "wopper-jawed." In the majority of individuals, the right side of the lower jaw is slightly longer than the left, states Dr. Ales Hrdlicka of the Smithsonian Institution, who has recently completed a detailed study of more than 5,000 human jaws in the collections of the U. S. National Museum. They range in age from early Egyptians to modern Eskimos.

The difference, reports Dr. Hrdlicka, is slight yet apparently constant. It is slightly greater in women than in men, and is more noticeable among white people than in other races.

Biggest and stoutest lower jaws are those of Eskimos and northern Indians. Dr. Hrdlicka attributes this extraordinary development to the need among these cold-land peoples for eating large quantities of food, much of it uncooked and tough. Weakest jaws, in general,

were found to belong to the white races.

In the course of the studies, many atavisms, or evolutionary throw-backs, were found on lower jawbones of all races. Most of these were detected on the ramus, which is the upturned back angle of the jaw, leading up to the jaw hinge. This is the latest-evolved part of the vertebrate jaw, for lower backboned animals do not have it, and it is poorly developed in the more primitive mammals.

On some jaws in the Museum collection, the border of this angle is semi-circular, as in many of the higher mammals below the level of the primate family. It may protrude backward, as in some of the lemurs, primitive relatives of apes and man. About the point of the angle may occasionally be found modifications of a peculiar bulge known to anthropologists as the "lemurian process."

*Science News Letter, March 15, 1941*

## AERONAUTICS

### Italian Plane, "Kangaroo," Carries Smaller Plane

**S**INGLE seat fighting planes as well as bombs, troops, gasoline and other supplies are carried in the largest airplane of the Italian Air Force. Details and pictures of the craft, called the "Canguru" (kangaroo) are given in *The Aeroplane*, British aviation weekly. (Jan. 31)

The Canguru is a monoplane, made at the Savoia-Marchetti works, has wing span of 97 feet 6 inches, and a length of 73 feet 6 inches. At 8200 feet, it has a top speed of 230 miles per hour, and its range is 2480 miles. Power is from three 950 horsepower Alfa-Romeo engines. *The Aeroplane* writer comments "For its size, the Canguru appears to be underpowered."

Several types of fighting planes have been carried from Italy to Libya in the Canguru. "The wings are removed and stowed beside the fuselage, standing on their leading edges," it is stated. "The tailplane, fin and rudder are similarly accommodated. The undercarriage is detached and stowed beneath the fuselage."

It is believed that the big pieces are inserted into the Canguru through the bomb doors in the bottom of the fuselage. A reinforced girder along the roof of the cabin carries a block and tackle which can be used to lift the heavy parts, with the engine of the fighter attached.

*Science News Letter, March 15, 1941*

## ENGINEERING

### New Factory Is Being Built Underneath Huge Box

**D**EVISING a new technique, a \$21,000,000 factory is being built in Detroit—inside a box. Underneath a shell of composition board and tar paper, the Ford Motor Co. is rushing completion of a new factory to produce aircraft engines. Inside the box, said to be the largest in the world, continuous construction, 24 hours a day, regardless of weather or darkness, is going forward.

The box-like shell was constructed around the building about 10 feet from the finished wall line. It was erected as soon as the steel framework was in position. Temperatures inside are supplied by the heat of great charcoal braziers, permitting concrete to be poured in the dead of winter.

The factory will be 1,000 feet long and 300 feet wide. Started in October, it is expected it will be ready for production this month. Erection is proceeding progressively from one end to the other, so that the front end can be occupied before the other end is finished.

The "box shelter" type of construction was developed in Russia to permit construction in any kind of weather, especially during the heavy winters.

*Science News Letter, March 15, 1941*

## PALEONTOLOGY

### Wasp Nest From Late Dinosaur Days in Museum

**T**HE FOSSILIZED comb of a wasp nest whose inhabitants might have stung the last of the dinosaurs has been added to the collections of the Smithsonian Institution. It was found in southwestern Utah by Dr. J. B. Reeside, Jr., and Dr. C. E. Dobbin of the U. S. Geological Survey, and has been described (*American Journal of Science*, January) by Dr. Roland W. Brown, also of the Survey. It dates from the late Cretaceous, last phase of the dinosaur age, about 80 million years ago.

Wasps, says Dr. Brown, apparently preceded their relatives, the bees, into the world, and pioneered in the transfer of pollen among flowering plants, which had come into existence not long before. The great development of insects and the high evolution of flowering structures have gone on side by side ever since. It is doubtful if either could have come to pass without the other.

*Science News Letter, March 15, 1941*

MEDICINE

# Chlorophyll for Healing

## Green Pigment from Plants Now Used Experimentally For Treating Wide Variety of Diseases and Infections

By LOIS MATTOX MILLER

**D**EEP in the mysterious affinity between sunlight and the earth's green plants, science hopes it has found something which brings man closer to victory in his old struggle against bodily infection. New to medicine, this substance probably is as old as life itself. It is simply chlorophyll, the coloring matter with which Nature paints forest, field, and garden a brilliant green.

Don't be surprised if your doctor tells you that he has never heard of chlorophyll being used this way. The work being done is so recent that only a relatively small number of the nation's 175,000 physicians have heard of it. But evidence of chlorophyll's medicinal value is most encouraging, so far. Distinguished medical specialists report that in 1,200 recorded cases they have seen chlorophyll combat deep-lying infections, cleanse open wounds, relieve chronic sinus conditions, and banish common head colds. More remarkable, they say, is the way it accomplishes these things—speedily and effectively, with none of the harsh, irritating effects common to most antiseptics. Chlorophyll, the healer, is at once powerful and bland—devastating to germs and yet gentle to the wounded body tissues. Exactly how it works is still Nature's secret. To the layman, at least, the phenomenon seems like green magic.

### Age-Old Puzzle

For ages men have puzzled over the question—"What makes grass green?" About a century ago chemists segregated the green pigment in growing plants and named it chlorophyll. But until 1913 all attempts to explore the chlorophyll molecule failed. Then a German chemist, Dr. Richard Willstätter, made uncannily correct deductions about it. He likewise pointed out that the green miracle of nature is a process closely linked to the secret of life itself.

All life energy comes from the sun. Green plants alone possess the secret of how to capture this solar energy, and pass it on to man and beast.

A ray of sunlight strikes the green leaf and instantly the miracle is wrought. Within the plant molecules of water and carbon dioxide are torn apart—a feat which the chemist can accomplish only with great difficulty and expense. First there are only lifeless gas and water; then, presto! these elements are transformed into living tissue and useful energy. Oxygen is released from the plant to revitalize the air we breathe. Units of energy, in sugars and other carbohydrates, are speedily manufactured and stored up in the living plant.

Out of the process stems much of what we know as life and growth. Man consumes the energy as food—both in vegetables and the flesh of herbivorous animals. He uses it in the form of coal, oil, and gas—green vegetation locked up in the earth for ages.

### Like Blood's Hemoglobin

These facts deduced by Willstätter were dramatic. But closer study yielded something even more baffling. The chlorophyll molecule bears a striking resemblance to hemoglobin, the red pigment in human blood. The red blood pigment is a web of carbon, hydrogen, oxygen, and nitrogen atoms grouped around a single atom of iron. Nature's green pigment is a similar web of the same atoms—except that its centerpiece is a single atom of magnesium. Obviously, this similarity had some significance. But what could it be?

Thus the multiple mysteries of chlorophyll became a standing challenge to the imagination and genius of scientists. Some of them, including Charles F. Kettering, began to probe for the basic secrets of the "sun trap" hoping to find some artificial means of directly tapping solar energy. Still others, like Dr. Hans Fischer, a German who won the Nobel Prize in 1931 for his work on the red-blood pigment, searched for possible medical uses for chlorophyll.

Kettering set up a Foundation for the Study of Chlorophyll and Photosynthesis at Antioch College in 1930 and enabled a whole staff of scientists to explore the phenomenon from all angles.

One of the first questions the Ohio researchers asked themselves was—What happens to chlorophyll as it passes through the digestive systems of animals and human beings? They found that in partially digested grass the break-down product of the chlorophyll molecule bore an even closer resemblance to one of the fragments of red blood pigment, called hematin. And when this partly digested food was fed to rats it directly stimulated the formation of red blood cells.

At about the same time, Dr. Fischer in Germany announced that for some time he had been using chlorophyll in the treatment of anemia, with promising (although by no means conclusive) results. These clues from two divergent projects served to spur on the efforts of biochemists elsewhere, among them investigators at Temple University in Philadelphia.

Doctors there discovered a curious thing: the green solution seemed to thicken and strengthen the walls of the body cells of living animals. That logically led them to ask, might not chlorophyll be useful in helping the body to combat bacterial invaders?

Here was a medical need even more urgent than a new treatment for anemia. Years of research had produced a host of antiseptics; but, from the doctor's viewpoint, even the best of them shared a common drawback. An antiseptic solution strong enough to kill germs often damaged the surrounding body tissues. Obviously, the ideal agent would be something that enabled the body to make short shrift of bacteria, and at the same time was soothing to the tissues. Could chlorophyll be the answer?

### No Power in Test Tube

Nature's green pigment was puzzling in the laboratory. It possessed no power of its own to kill germs; it would not perform in a test tube. But in contact with living tissues, it appeared to increase the resistance of the cells and inhibited the growth of bacteria, thus preventing the germs from spreading their poisons. Its peculiar faculty for breaking down carbon dioxide and releasing oxygen apparently spelled defeat for the bacteria which thrive only in sealed wounds away from air. And not the least of its advantages was the fact

that it could be applied in generous doses with soothing rather than irritating effects.

As the next tentative step, it is reported, the Department of Experimental Pathology at Temple extracted quantities of chlorophyll from green nettles, and prepared solutions and ointments suitable for a wide variety of infections. Then the medical specialists in charge of departments and clinics of the Temple University Hospital began to treat patients under carefully controlled conditions.

#### Announced in July

Last July the first report on the therapeutic use of chlorophyll was published in the *American Journal of Surgery*. Under these auspices, and with a score of distinguished doctors adding their own testimony, the green pigment was described as an important and effective drug. Some 1,200 cases, ranging from deep internal infections like peritonitis and brain ulcers to pyorrhea and skin disorders, had been treated and documented, and in case after case the doctors had been able to close their reports: "Discharged as cured."

People had been brought in to the hospital with bursting or infected appendices and spreading peritonitis. Appendectomies had been performed, and the task of checking the gravely dangerous infection had been left to chlorophyll. Chlorophyll solutions had been flooded into deep wounds through drainage tubes, and applied elsewhere on wet dressings or in ointments and salves.

Ulcerated varicose veins, osteomyelitis (a difficult bone disease), skin disorders,

and various types of infected wounds had been cured and healed. Applied in numerous cases of mouth infections, such as Vincent's angina and advanced pyorrhea, the results were immediate and positive. "The gums tightened up entirely," Dr. Homer D. Junkin commented, "and have remained clean since."

But the most spectacular results occurred in the treatment of chronic sinus infections and head colds. In 1,000 cases of respiratory infections — sinusitis, rhinitis, head colds, etc.,—treated under the supervision of Dr. Robert Ridpath and Dr. T. Carroll Davis, prominent specialists reported "there is not a single case recorded in which either improvement or cure has not taken place." Chlorophyll packs, skillfully inserted into the sinuses, it is reported, had a drying effect, cleared up congestion, and gave immediate relief. Congested head colds were cleared up within 24 hours.

How does chlorophyll affect the system? Beyond the theory that it strengthens the cells, inhibits bacterial growth, and gives the body tissues an opportu-

nity to apply their own defenses, these doctors are frank in admitting that they don't know. There is considerably more to the process than just that, they say. Its exact nature may never be understood fully. "It is possible," says one Temple pathologist, "that the bacteria, being of vegetable origin, yet possessing ordinarily no chlorophyll, undergo some biological change in the presence of the substance."

The experts who have nursed it through its laboratory period and clinical trials are enthusiastic; they freely predict its wider and more effective use by doctors.

The medical profession at large, conservative, and properly so, will study the effects of chlorophyll long and carefully before it recommends its general use. But there are increasing reports of hospitals and private practitioners who are making tests. They hope the early evidence that Nature's "green magic" heals as well as nourishes man, stands the ordeal of further trial. It is one of the most interesting lines of research on the frontiers of medicine today.

*Science News Letter, March 15, 1941*

#### PUBLIC HEALTH

## Army Appoints Commissions To Fight Epidemics

THE ARMY's fight to keep epidemic diseases such as measles, influenza and meningitis out of training camps has been advanced by the appointment of five special commissions of civilian physicians to advise and aid the Army's own disease fighters.

Dr. A. J. Warren, of the Rockefeller Foundation's International Health Division, Dr. O. T. Avery, of the Hospital of the Rockefeller Institute, and Dr. Kenneth F. Maxcy, of the Johns Hopkins School of Hygiene and Public Health have been added to the main board of civilian physicians, of which Dr. Francis Blake, Yale University School of Medicine, is chairman. In addition the following have been appointed directors of special commissions:

Influenza: Dr. Thomas Francis Jr., New York University College of Medicine.

Epidemiological Survey: Dr. S. Bayne-Jones, Yale University School of Medicine.

Measles: Dr. Joseph Stokes, Jr., Uni-

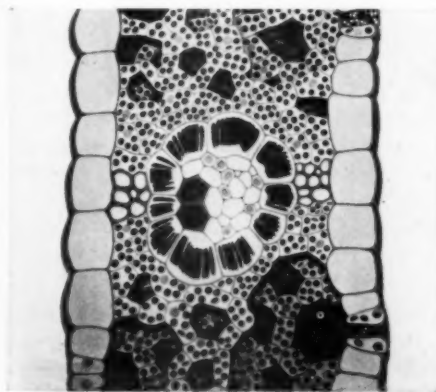
versity of Pennsylvania Medical School.

Meningitis: Dr. Perrin Long, Johns Hopkins University School of Medicine.

Neurotropic Virus Diseases (this would include infantile paralysis and encephalitis or "sleeping sickness"): Dr. John Paul, Yale University.

Appointment of directors of two other special commissions and members of the commissions is now under way.

*Science News Letter, March 15, 1941*



#### CHLOROPHYLL

In this cross section of a corn leaf is shown where chlorophyll is found. The little black dots are the chlorophyll bodies.

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## CHEMISTRY

# Snowflakes Become Synthetic Fossils in New Plastic Molds

Single Flake Laid in Drop of Solution, Then Covered With Another Drop, Leaving It Encased

See Front Cover

**C**ASTINGS of snowflakes, preserving permanently in synthetic fossil form all details of their delicate microscopic lacework, have been made in one of the new chemical plastics by Vincent J. Schaefer, of the General Electric Research Laboratory. (*Science*, March 7.)

Apparatus and technique, Mr. Schaefer says, are quite simple. All that is needed is a board or light table covered with black velvet or other suitable material, a toothpick or bit of wire for picking up the snowflakes, some glass microscope slides, and a bottle of thin solution of the plastic known by the trade name of Formvar 15-95. The entire kit is kept in a sheltered place outdoors, so that it will be at the same temperature as the surrounding air when a snowstorm comes on.

When the flakes begin to fall, the black table is set out where it can catch them. A suitable flake is selected and laid in a drop of the plastic solution. If it is a big flake, a little more of the solution may be dropped on top of it. Soon the solvent evaporates, leaving the flake encased in a solid mold of hardened plastic, which preserves every detail of its structure. It may then be taken indoors and studied or photographed through a low-power microscope.

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The snowflake molds have a thickness of 20,000 Angstrom units.

A slight modification of the method can be used in making permanent records of other ice-crystal forms, such as hoar-frost, breath-patterns and common frost crystals.

In technical terms, the solution used by Mr. Schaefer consists of 1% of polyvinyl formal resin in ethylene dichloride.

*Science News Letter*, March 15, 1941

## ENGINEERING

## Earthquake-Resistant Brick Used in Los Angeles

**B**RICK wall construction which resists cracking in an earthquake even better than reinforced concrete is now in general use in Los Angeles, states J. A. Muller, Jr. (*Bulletin, Society of American Military Engineers*, February.)

"Research and experimentation by the War Department," he says, "especially in regard to the resistance of impact of the explosives, may result in its greater use in fortifications."

In addition to building walls, he declares, the "reinforced grouted brickwork," as this type of construction is called, has also been employed in retaining walls, bridges, conduits, etc. He suggests that it would be adapted to structures intended to withstand the wind forces of tornadoes in the Midwest, or the hurricanes of the southeastern parts of the United States.

To make such a wall, of eight inches thickness, for example, a series of  $\frac{3}{8}$ -inch steel reinforcing rods is placed vertically 24 inches apart. Bricks  $3\frac{1}{2}$  inches thick are built up on each side of the rods, leaving about a one-inch space between them. As each course is laid, a liquid grout, consisting of one part of cement and five parts of sand, mixed with water, is poured into the space between the bricks. With wider walls, bricks are floated in the grout to give extra solidity. The grout hardens, and binds the two sets of brick and the steel rods into a single solid structure.

Mr. Muller says that the method was developed as a result of an investigation made following the disastrous Long Beach earthquake in 1933, which did its principal damage to brick buildings, constructed in the usual way. This caused the public to lose confidence in such materials.

Forty-three brickwork jobs with some form of grouting and reinforcement had been built before this quake, and even those in the vicinity of Long Beach showed no cracks. These buildings afforded the basis of the new design, which has been tested with artificial earthquakes on a shaking table.

"It has been found," he announces, "that reinforced brickwork is more elastic than reinforced concrete and, therefore, less likely to crack under seismic strain."

*Science News Letter*, March 15, 1941

## ANTHROPOLOGY

## Wrist-Bone from Africa Stirs Up Discussion

**A**PE or human? A small bone from a South African cave is stirring up discussion among British scientists, despite the distractions of war.

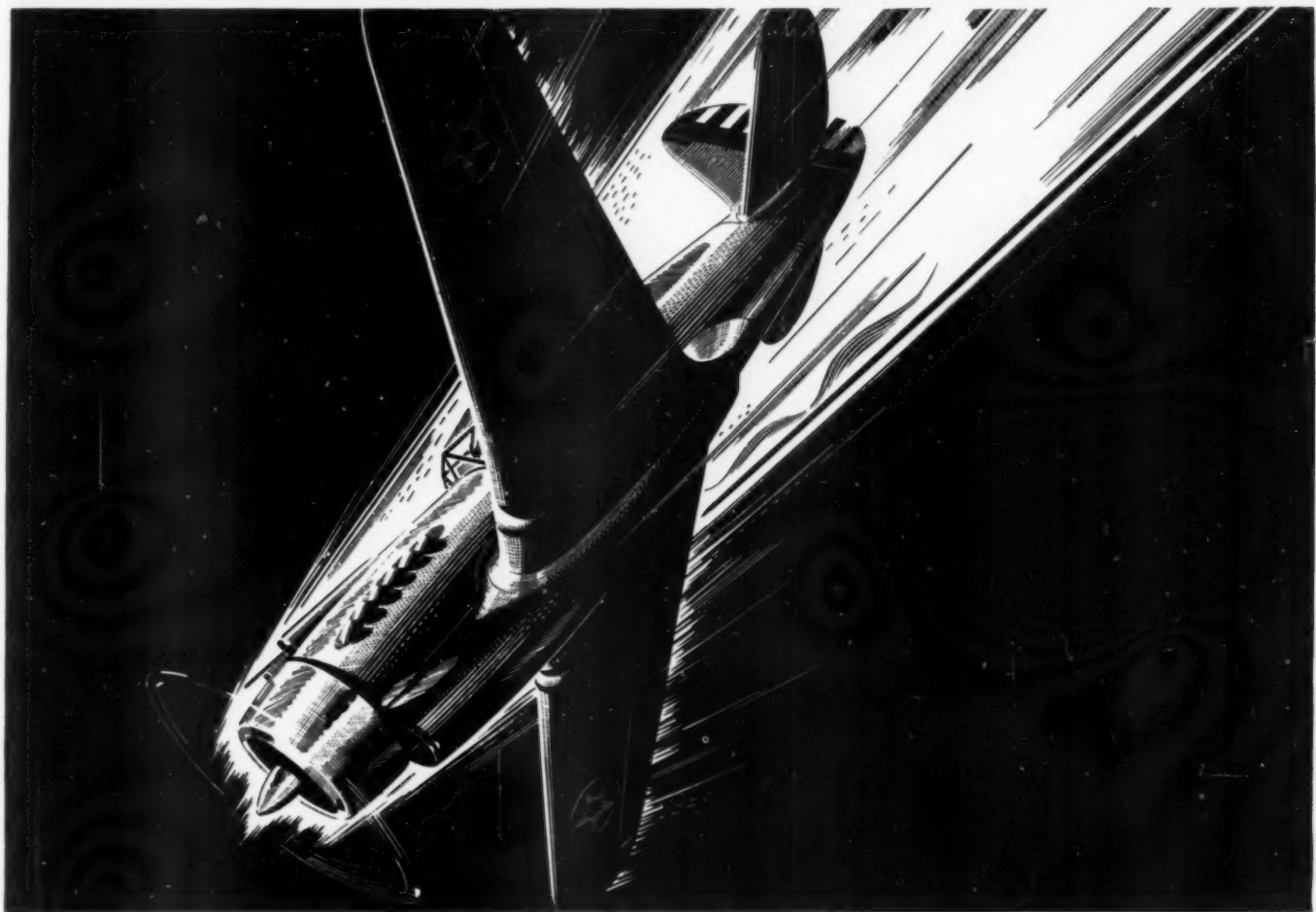
A short time ago, the British journal, *Nature*, (Jan. 18) carried an account of a wrist-bone found in the same cave at Sterkfontein, S. A., that had yielded the skull and other remains of a remarkably man-like extinct ape species known as *Plesianthropus transvaalensis*. The bone was considered to belong to the same species by the discoverer, Dr. Robert Broom of the Transvaal Museum. It was very much like the corresponding wrist-bone of a woman of the primitive Bushman people.

Now, in a subsequent number (*Feb. 1*) of the same magazine that has succeeded in running the gantlet of the Nazi bombers and submarines, the veteran British anthropologist, Sir Arthur Keith, expresses his opinion that the bone not only looks human but actually is human.

It is so like the Bush specimens, and so unlike those of other races of man and ape, declares Sir Arthur, "that I regard the Sterkfontein bone, not only as being human, but also as representing a prehistoric Bushman. If I am wrong in this inference, then we have to accept Dr. Broom's supposition that the Sterkfontein ape had a truly human hand—one modelled on the small and delicate lines of a Bushwoman."

*Science News Letter*, March 15, 1941

ANOTHER WAY ELECTRICAL POWER IS SPEEDING PRODUCTION



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fuel gas, can be used for the treatment of all SAE steels. Proof of results is found in reports like this:—"In one shift we hardened 20,000 small alloy bolts. This would have taken a week in our old furnace, with the added cost and delay of pickling."

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## MATHEMATICS

# Congress Juggling Figures In Struggle With Seats Problem

## Mathematicians on the Sideline Are Rooting for Method of Equal Proportions for Reapportioning

CONGRESS is engaged in a struggle to make democracy work on the best mathematical basis, and mathematicians on the sidelines are rooting for the method of equal proportions instead of the method of major fractions.

It is a matter of reapportioning the seats in the House of Representatives, always a sore subject because it may legislate some present representative out of his job or so warp his district that he has to start building his political fences in unfamiliar territory.

Because the number of seats in the House is fixed at 435 and the country continues to grow in population, new standards should be set with each census. It is now time to make the changes based on the 1940 census.

Determining just what states shall have how many representatives has been done by the method of major fractions in the past. This mathematical procedure has been vigorously attacked by mathematical authorities, led by Dr. E. V. Huntington, Harvard's professor of mechanics.

The 1941 apportionment bill, H.R. 2665, has passed the House and is about due to come up in the Senate, which is not directly concerned because the number of senators remains two for each state regardless of how the country grows. If this equal-proportions bill does not pass the Senate, however, the now outdated method of major fractions will be used in allotting the representatives.

"The retention of the method of major fractions in the 1941 apportionment would imply the complete abandonment of any attempt to equalize the congressional districts among the several states," in the opinion of Dr. Huntington.

If Congress desires to equalize both the congressional districts and the number of representatives per million inhabitants among the several states, the methods of equal proportions will always give a better result on a percentage basis.

But Congress faces a dilemma when it desires to measure the inequalities by absolute differences instead of by the more natural percentage differences. For minimizing the absolute differences between the numbers of representatives per million, the major fractions method is better. For minimizing the absolute differences between congressional districts,

the equal proportions method is better.

The mathematicians say that the very plausible desire to make the congressional districts in each state differ as little as possible from a population of 301,164, the average congressional district for the country at large, just won't work because it leads to a mathematical paradox.

It is just as easy for the Bureau of the Census, which makes the computations, to figure the problem of what states will have the House seats by major fractions or equal proportions.

Here's a test computation under the two methods: Michigan has a 1940 population of 5,256,106, Arkansas has 1,949,387. Under the method of equal proportions, Michigan would have 17 representatives with 309,183 to a district and Arkansas would have 7 with 278,484 to a district. This is an absolute difference of 30,699 and a percentage difference of 11.02%. By the method of major fractions, Michigan would have 18 with 292,006 to a district, and Arkansas would have 6 with 324,898 people to a district. The absolute difference in this case would be 32,892 and the percentage difference would be 11.26%. Thus the inequalities between the congressional districts whether absolute or relative, is smaller under the method of equal proportions.

*Science News Letter, March 15, 1941*

## ENTOMOLOGY

# Borers-From-Within Menace Supplies for Army and Navy

FOOD, clothing, construction material and other supplies for the Army and Navy are menaced by unseen borers-from-within, warned Prof. W. B. Herms, University of California entomologist. They are the armies of moths, weevils, termites and other destructive insects.

Rats also can rob soldiers and sailors of the things the taxpayers buy for them. To prevent as much of these losses as possible, Prof. Herms recommended attaching trained insect fighters to the Quartermaster Corps. He pointed out that the Sanitary Corps already has its quota of entomologists.

Each year insects damage stored grain and milled products in the United States to an estimated extent of \$300,000,000. That is a greater property damage than was inflicted by the British bombers and torpedo planes on the Italian Navy in the raid on Taranto, hailed as a great victory. Termites annually cause losses of more than \$40,000,000, nearly half the price of a battleship, while clothes moths eat up well over \$20,000,000 worth of woolens, or enough to pay for good-sized cruiser. Total losses traceable to

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insects and rats come close to a billion dollars annually.

One attack on the problem of controlling insects is being made with the aid of the great cyclotron at the University of California. Experimental laboratory feedings are made with foods containing elements given radioactive "tags" with this giant instrument. This, explained Dr. Roderick Craig, College of Agriculture entomologist, enables scientists to trace more accurately the course of poisons used in controlling the pests.

It is even possible that the cyclotron may eventually be used in direct control of certain kinds of insects, for its stream of high-velocity particles constitutes a veritable death ray to them. Other forms of radiation have also been demonstrated as lethal to insects, including high-frequency radio waves, infra-red and ultraviolet radiations, and X-rays. Some of these kill insects by heating their tissues, others sterilize them out of existence.

*Science News Letter, March 15, 1941*

#### ENGINEERING

### Magnesium Sulfate Plaster Like Cement in Strength

**T**HOUGH chemically the same as plaster of Paris, a new gypsum plaster, described at the meeting of the American Institute of Chemical Engineers, is about twice as strong as the old-fashioned article. In fact, it approaches Portland cement in strength.

The new product was announced by E. P. Schoch and William A. Cunningham of the University of Texas. It is prepared, they explained, by heating gypsum in a magnesium sulfate solution, whereas plaster of Paris and ordinary wall plaster are made by the dry calcination or burning of gypsum.

Experiments in a small pilot plant indicate, they stated, that it can be made at a cost of \$8.82 per ton.

*Science News Letter, March 15, 1941*

## RADIO

Dr. Karl M. Dallenbach, Cornell University professor of psychology and editor of the *American Journal of Psychology*, will tell of the work of Emergency Committee on Psychology, organized by the National Research Council and national psychological societies, as guest scientist with Watson Davis, director of Science Service, on "Adventures in Science," over the coast to coast network of the Columbia Broadcasting System, Thursday, March 20, 3:45 p.m. EST, 2:45 CST, 1:45 MST, 12:45 PST. Listen in on your local station. Listen in each Thursday.



### Predator Problems

**P**REDATORY animals, like coyotes and bobcats, that prey on game birds, deer and other creatures that sportsmen like to hunt, present some of the most difficult problems with which wildlife managers have to wrestle. They took up a good part of the attention of the recent Sixth North American Wildlife Conference at Memphis. Should they be shot on sight, and trapped, and poisoned, or should they be let alone, so that nature may work out its own balance?

Keep them under control, insisted E. A. Schilling of the U. S. Forest Service. Neglect of predator control, he declared, has often meant severe game depletion, whereas rational control measures have been followed by restoration of good hunting. In support of his contention he cited the comeback of wild turkey in Southeastern woods after some of the bobcats and foxes had been trapped out. Since man has so completely and permanently upset the ancient balance of nature, there is no chance of its restoring itself so long as man remains on the scene, he declared. However, Mr. Schilling emphasized, control of predators does not mean wiping them out completely. No sensible wildlife manager would advocate that, he said, and anyway it couldn't be done even if it were attempted.

Testimony of coyotes' destructiveness to deer, in a quite different type of country, was offered by E. E. Horn of the U. S. Fish and Wildlife Service, who works out of Berkeley, Calif. In the Mono Basin of Santa Barbara County, Mr. Horn stated, a study of stomach contents of 371 trapped coyotes disclosed remains of deer in more than half of

them. This was supported by other field evidence.

However, the question arose as to the desirability of permitting deer to increase greatly in this particular region. The Mono Basin is a watershed, said Mr. Horn; its chief raw crop is water. In such an area, too many deer would be undesirable. If coyotes are to be killed off, deer will increase and more hunting will have to be permitted. But if more hunters go into the area there will be more forest and brush fires—which again is not so good, from the watershed management viewpoint. And so the problem goes round and round. A wildlife administrator's life is not a simple one.

If control of predators is determined upon, it is generally inadvisable to attempt it by means of offering bounties, stated Richard Gerstell of the Pennsylvania Game Commission. Bounty systems shift administration problems into the legislature, where they do not belong, he pointed out. Furthermore, there is a tendency for people to claim bounties on animals they would have killed for sport or for other reasons, which of course is a waste of public money. Worse still is the likelihood of outright fraud, as when bounties are claimed on animals killed outside the areas where the bounty applies. Better results, in Mr. Gerstell's opinion, can be obtained by direct employment of properly trained hunters and trappers, and by the education of the general public through press, radio, motion picture film and other effective means.

*Science News Letter, March 15, 1941*

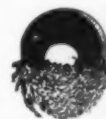
Dogs do not see the world in colors, but fish do.

### INTERESTED? in Science



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# •First Glances at New Books

## ECONOMICS

**BILLIONS FOR DEFENSE**—Alfred G. Buehler, ed.—*American Academy of Political and Social Science*, 219 p., \$2 paper; \$2.50 cloth. (The Annals, Vol. 214, March, 1941). The present defense program is costing the American people unprecedented sums of money. Various possible methods of raising the necessary amount are discussed in this volume by a number of experts.

*Science News Letter*, March 15, 1941

## PSYCHOLOGY

**FACTORIAL STUDIES OF INTELLIGENCE**—L. L. Thurstone and Thelma Gwinn Thurstone—*Univ. of Chicago*, 94 p., \$1.50. A report of the authors' latest research in attempting to isolate the primary mental abilities and a description of the tests used. Microfilm copies of the complete tests may be obtained from the American Documentation Institute, care of Science Service.

*Science News Letter*, March 15, 1941

## PSYCHOLOGY

**FACTOR ANALYSIS TO 1940**—Dael Wolfle—*Univ. of Chicago Press*, 69 p., \$1.25. A clear explanation for psychologists of a mathematical technique which the author believes to be "a powerful exploratory tool" for searching out the human abilities underlying performance in any particular field.

*Science News Letter*, March 15, 1941

## SURGERY

**BONE GRAFT SURGERY IN DISEASE, INJURY AND DEFORMITY**—Fred H. Albee and Alexander Kushner—*Appleton*, 403 p., illus., \$7.50.

*Science News Letter*, March 15, 1941

## MEDICINE—BIOGRAPHY

**TUBERCULOSIS AND GENIUS**—Lewis J. Moorman—*Univ. of Chicago Press*, 271 p., illus., \$2.50. Dr Moorman shows the influence tuberculosis had on the lives and achievements of 10 famous men and women, explaining in an introduction what medical men know of the psychological influence of this disease.

*Science News Letter*, March 15, 1941

## PHYSICS

**TEMPERATURE, ITS MEASUREMENT AND CONTROL IN SCIENCE AND INDUSTRY**—Symposium held under auspices of American Institute of Physics—*Reinhold Publishing Corp.*, 1362 p., charts, \$11. All phases of temperature are covered in de-

tail in this authoritative work, such as, to mention at random a few of the headings, "Thermoelectric Thermometry," "The Resistance of Living Matter to Very Low Temperatures," "Automatic Temperature Control," "Earth Temperatures in Oil Fields," "Oxide Coated Filaments," etc.

*Science News Letter*, March 15, 1941

## MEDICINE

**THE FUNDAMENTALS OF NUTRITION**—Estelle E. Hawley, Esther E. Maurer-Mast and others—*Thomas*, 477 p., illus., \$5. A technical book for doctors and others professionally concerned with nutrition.

*Science News Letter*, March 15, 1941

## MEDICINE

**A SURGEON EXPLAINS TO THE LAYMAN**—M. Benmosché—*Simon and Schuster*, 317 p., illus., \$3. A simple, clear account of how and why various surgical operations are performed, written to dispel any fear of surgery due to ignorance about it.

*Science News Letter*, March 15, 1941

## SAFETY

**COMMON-SENSE DRIVING AND PEDESTRIAN RULES WITH RULES FOR BICYCLE RIDERS**—Dennis H. Jackson—*Dennis Production, Inc.*, 197 p., illus., \$1.65. Since the boys and girls now in school will be the auto drivers of coming years, it seems to be sound reasoning that proper training of them will do much to cut down the accident toll of the future. This excellent book is addressed to them, and should be widely used.

*Science News Letter*, March 15, 1941

## CHEMISTRY

**THE THEORY OF ORGANIC CHEMISTRY, An Advanced Course**—Gerald E. K. Branch and Melvin Calvin—*Prentice-Hall*, 523 p., \$4. A text for an advanced course, which deals with the electronic structural theory of atoms, and its application to organic chemistry.

*Science News Letter*, March 15, 1941

## TECHNOLOGY

**PRACTICAL JOB POINTERS**—Nelson L. Burbank, Comp.—*Simmons-Boardman*, 129 p., illus., \$2. Such pointers are included as methods of building a stiffening for a roof, forming a concrete coping, placing pipe in plastered walls, hanging a window box, etc.

*Science News Letter*, March 15, 1941

## GENERAL SCIENCE

**SCIENCE IN PROGRESS** (2nd series) —George A. Baitzell, ed. — *Yale Univ. Press*, 317 p., illus., \$4. Ten leaders in American science, Sigma Xi lecturers of two years, give authoritative and readable accounts of the state of progress in as many fields of science. Like the first series under this title, it is a notable and useful record.

*Science News Letter*, March 15, 1941

## PSYCHIATRY

**THE NEUROSES IN WAR**—Emanuel Miller, ed.—*Macmillan*, 250 p., \$2.50. See page 167.

*Science News Letter*, March 15, 1941

## ZOOLOGY

**FURTHER NOTES ON MEXICAN SNAKES OF THE GENUS SALVADORA**—Hobart M. Smith—*Smithsonian Institution*, 12 p., illus., 10c.

*Science News Letter*, March 15, 1941

## ECONOMICS

**HOW TO START A LIFE INSURANCE PROGRAM**—*The Institute for Risk Analysis*, 32 p., 50c. A clearly written statement of those aspects of insurance which must be familiar to anyone in order to select the type and amount of protection suitable to his needs. It describes in figures what becomes of the insurance premium, and clears up many points not ordinarily discussed by agents.

*Science News Letter*, March 15, 1941

## ASTRONOMY

**THE LAPLACIAN AND GAUSSIAN ORBIT METHODS**—Samuel Herrick, Jr.—*Univ. of Calif. Press*, 56 p., 75c. Of interest to mathematical astronomers.

*Science News Letter*, March 15, 1941

## TECHNOLOGY

**TECHNOLOGY AND SOCIETY, The Influence of Machines in the United States**—S. McKee Rosen and Laura Rosen—*Macmillan*, 474 p., illus., \$4. In this discussion of the changes which modern inventions have brought to United States life are considered their economic and social aspects, and such phases as the effect of centralization on a particular industry and the social effect of being sick in a hospital, rather than in the home. They conclude that "unless and until the use of technology is subordinated to constructive and socially desirable ends, the prospects for society in the future remain dim and uncertain."

*Science News Letter*, March 15, 1941